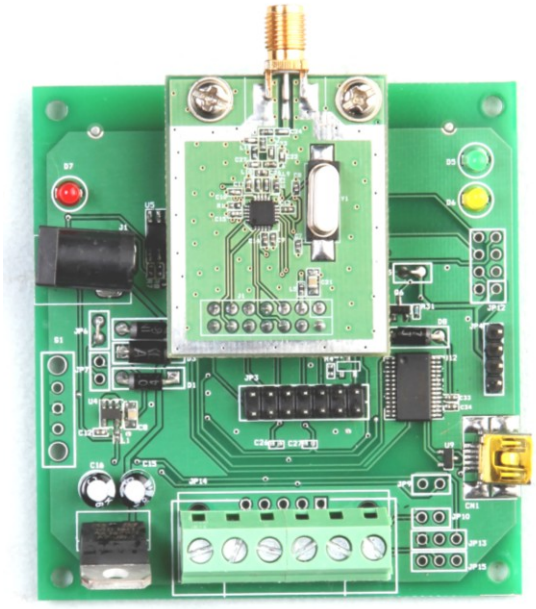

RDSRF-422-T8FZ
RS422 to RF User Configurable in 868 MHz
User Manual

Reindeer Technologies Pvt Ltd

Excellence through Innovation

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1 Overview

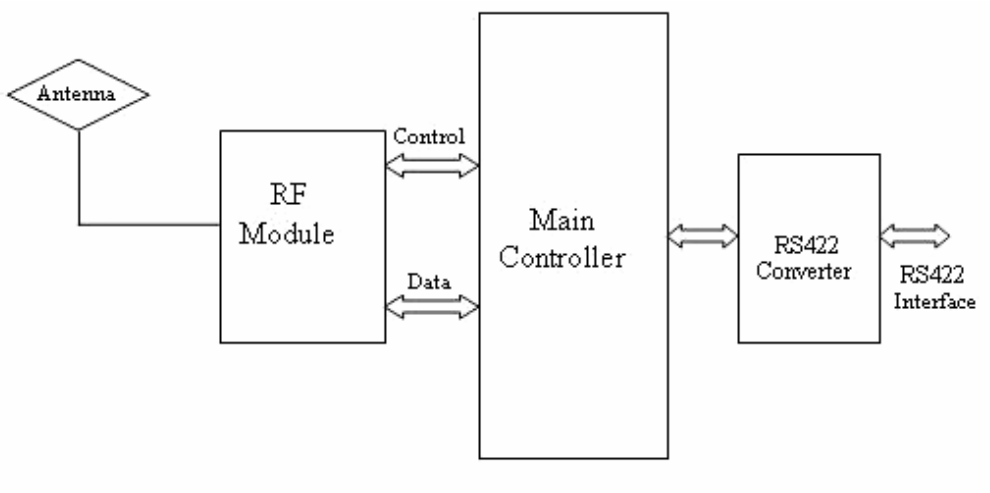


Figure 1: RDSRF-422-T8FZ Block Diagram

The RDSRF-422-T8FZ is single board high performance and low power serial to wireless solution. It is a complete plug and play system where the user can connect two boards and start a wireless communication between them instantaneously. The RDSRF-422-T8FZ can be integrated to existing systems without tedious software or hardware changes. These boards are intended to be used with systems which already have a RS422 interface.

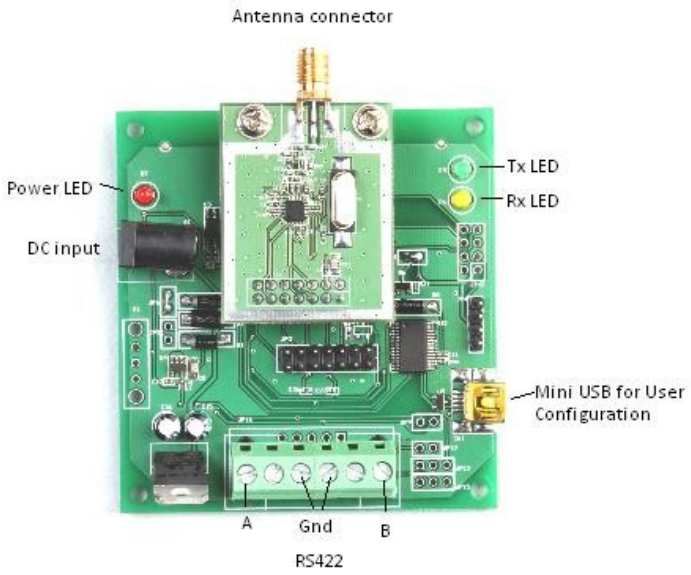
2 Features

- Direct RS422 to RF converter with built-in level converter
- Transparent RS422 to antenna solution
- Input voltage 5V DC
- Low Power Consumption
- Standard serial and RF baud rates from 1.4 Kbps to 115.2 Kbps possible
- Long range communication from 100 meters to 1000 meters line of sight
- Software based user configuration of frequency, serial and RF baud rate, output power, addressing etc (available in selected models only)

3 Applications

- Direct RS422 wire replacement
- Industrial automation
- Crane control systems
- Textile instrumentation panels
- Instrumentation devices interface
- Digital weighing systems
- Wireless sensor networking
- Remote data logging
- Automated meter reading

4 Connection Details



5 Theory of operation

The RDSRF-422-T8FZ operates in two different modes.

1) Receive Mode
2) Transmit Mode

5.1 Receive Mode

This is the default mode of operation after power on. In this mode the RF module will be in the listen mode, ready to receive data over the air and similarly the main controller will be in the wait mode to receive data either from the RF module or from the RS422.

When data is received from RF module the main controller will receive the data and will transfer it through RS422 connector.

Upon successful reception of data, the Rx LED will blink to acknowledge the reception.

Alternatively if data is received from the RS422 the main controller will receive all the data and will switch the RF module to transmit mode. After this the data is sent over the air.

5.2 Transmit mode

The RDSRF-422-T8FZ will switch to transmit mode only if data is received by the main controller through the RS422 port. And after successful transmission of the entire data the Tx LED will blink and the RDSRF-422-T8FZwill switch back to receive mode automatically.

6 Data handling in RDSRF-422-T8FZ

The RDSRF-422-T8FZ can transmit or receive any kind of data whether it is in ASCII or hex or in any other format. It has the capability of handling even user defined protocols. The maximum packet size allowed is 1024 bytes per transmission. A small delay has to be present between two packets. This delay will depend on the serial, RF baud rates and also the packet size. The time delay calculation will be explained in detail in the following section.

7 Time Delay Calculations

As discussed in the previous section the maximum allowed packet size in RDSRF-422-T8FZ is 1024 bytes. And a time delay is required in between two packets.

7.1 Example 1:

The serial port settings are

Baud Rate : 9600 bps
Parity : None
Data Bits : 8
Stop Bits : 1

The RF settings are

Baud Rate : 9600 bps

The time delay needed for a packet size of 1024 bytes can be calculated as shown below

Packet size = 1024 bytes

Time taken by the main controller to receive the entire packet = (1024 * 10)/9600.
= 1.066 Sec.

The time taken to transmit the entire packet = ((1024+1024+5)*8)/9600
= 1.711 Sec.

Adding both the time we get a total time of = 1.066+1.711
= 2.77 Sec

Adding an extra buffer time of 10% the total time delay between two packets of size 1024 byte will be 3 Sec.

7.2 Example 2:

The serial port settings are

Baud Rate : 9600 bps
Parity : None
Data Bits : 8
Stop Bits : 1

The RF settings are

Baud Rate : 9600 bps

The time delay needed for a packet size of 255 bytes can be calculated as shown below

Packet size = 255 bytes

Time taken by the main controller to receive the entire packet = (255 * 10)/9600.
= 0.266 Sec.

The time taken to transmit the entire packet = ((255+255+5)*8)/9600
= 0.429 Sec.

Adding both the time we get a total time of = 0.266+0.429
= 0.695 Sec or 695 ms.

Adding an extra buffer time of 10%, the total time delay between two packets of size 1024 byte will be 0.760 Sec or 760 ms.

7.3 General Equation for calculating time delay:

In general the time delay between packets can be calculated using the below equation.

Time delay between packets = Time 1 + Time 2 + (10% of (Time 1 + Time 2))

Where

Time 1 = (No. of bytes * 10) / serial baud rate

And

Time 2 = (((2 * No. of bytes) + 5) * 8) / RF Baud rate

8 User Configuration Mode

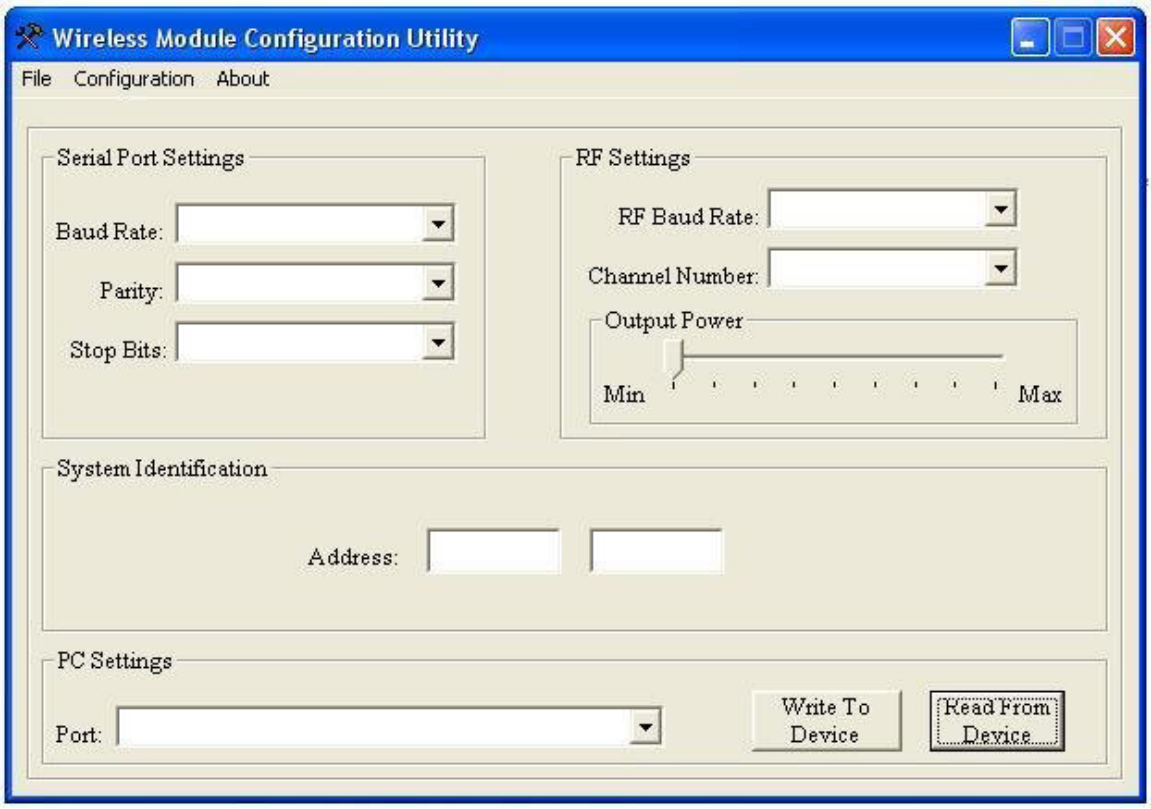


Figure4: Screenshot of Wireless Module Configuration Utility

Procedure for using the user configuration mode

1) Power on the unit.

2) Connect the unit to the PC using the Mini-USB.

3) Run the software on a PC

4) Select all the settings as mentioned below.

a) Serial baud rate

The Serial baud rate can be varied from 1.2 Kbps to 115.2 Kbps.

b) Serial parity

The Parity can be set to either Even, Odd or None.

c) Serial stop bits

The stop bits can be set to either 1 or 2

d) RF baud rate

The RF baud rate can be set from 1.4 Kbps to 38.4 Kbps

e) RF channel

The RF channel can be varied from channel 0 to channel 18

f) RF power output

The RF output can be varied from -30 to +12 dBm.

g) Address

This option can be used to set the address of the devices

j) COM port

This option is used to select the PC COM port

5) Now use the "Write to Device" button to download the settings to the unit.

6) Upon successful download the message "Programming Successful" is displayed, in case of any error the message "Programming Not Successful Reset the device and try again" will appear. In case of error power off the unit and repeat from step1.

Note:

Higher RF power output setting and lower RF baud rate setting will result in better communication range. More details on these settings are available in the software help file.

9. Ordering Information

Product part Number	**Description**
RDSRF-422-T8FZ	RS422 to RF Module in 868 MHz

10 Electrical Specifications

Parameter	Min	Max	Units
VCC – Power Supply	5	5	V DC
Operating Temperature	-40	+85	°C
RF output power		+10	dBm
Frequency of operation		868	MHz
Transmit Current consumption		33	mA
Receive current Consumption		27	mA

11 Accessories

The below mentioned accessories are available upon request. The cost of the product does not include these accessories.

1) Antenna

The antenna is mandatory for normal operation. The type of antenna can be selected from the wide ranges of antennae available in our website.

Note: - The device should not be operated without antenna.

2) Power Supply

Power adapters for the unit are available upon request.

Note: - This product comes without a casing.

12. Contact Us

12.1 Technical Support

Reindeer Technologies Pvt Ltd has built a solid technical support infrastructure so that you can get answers to your questions when you need them.

Our technical support engineers are available Mon-Fri between 9:30 am and 6:00 pm Indian standard time. The best way to reach a technical support engineer is to send an email to *support@reindeersystems.com*. E-mail support requests are given priority because we can handle them more efficiently than phone support requests.

12.2 Sales Support

Our sales department can be reached via e-mail at *sales@reindeersystems.com* or by phone at 91-44-45022335/42606907.

Our sales department is available Mon-Fri between 9:30 am and 6:00 pm.

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